

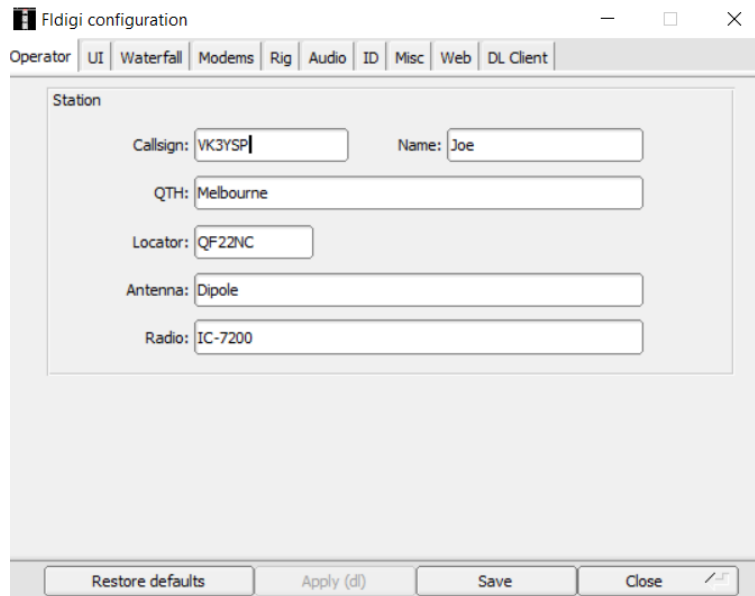
## SARC1 High Altitude Balloon Launch for 2016 Global Space Balloon Challenge

### **Balloon and payload information:**

- HAB Group: School Amateur Radio Club Network
- HAB Project: ANZAC Day Special Amateur Radio Event
- Balloon type: Qualatex 12683. 90cm Microfoil.
- Balloon expected cruising altitude: 9000m
- CASA approval: In accordance with CASR 1998 101.E—Small unmanned free balloon. Not required.
- Glen Eira City Council Permit under Local Law 314. Not required.
- Launch location: Victory Park, 21 Patterson St Bentleigh, Victoria, Australia (lat: -37.924251 lon: 145.030917)
- Launch date: 10:30am (0030UTC) Monday 25 April 2016
- Radio Frequency: 434.650MHz
- Radio Polarization: Vertical
- Radio Mode: FM
- Telemetry Mode: BPSK31
- Telemetry Frequency: 1255Hz
- Payload callsign: VK3YSP
- Payload name: SARC1
- Payload type: Telemetry only
- Payload weight: 50g
- Payload enclosure: 120mm polystyrene sphere
- Payload batteries: 3 x Energizer Lithium Ultimate L92 AAA
- Payload GPS receiver: U-blox NEO 6MV2. Dynamic Model: Airborne < 1g.
- Payload temperature sensor: LM35 (-42 degree limit)
- Payload processor: Arduino Pro Micro 16MHz
- Payload transceiver: DORJI DRA818U
- Payload antenna. UHF Inverted ground plane
- Payload frame rate: 1/min
- Payload RF output power: 500mW
- Payload min operating voltage: 2.7
- Payload expected endurance: 5.5 hours

## How to setup and track SARC1:

1. Connect your PC to the internet.
2. Download and install the latest version of dl-fldigi from: <https://ukhas.org.uk/projects:dl-fldigi>
3. Start dl-fldigi.
4. Select Configure | Operator. Enter your callsign, name, QTH, locator, antenna and radio. Save and close.

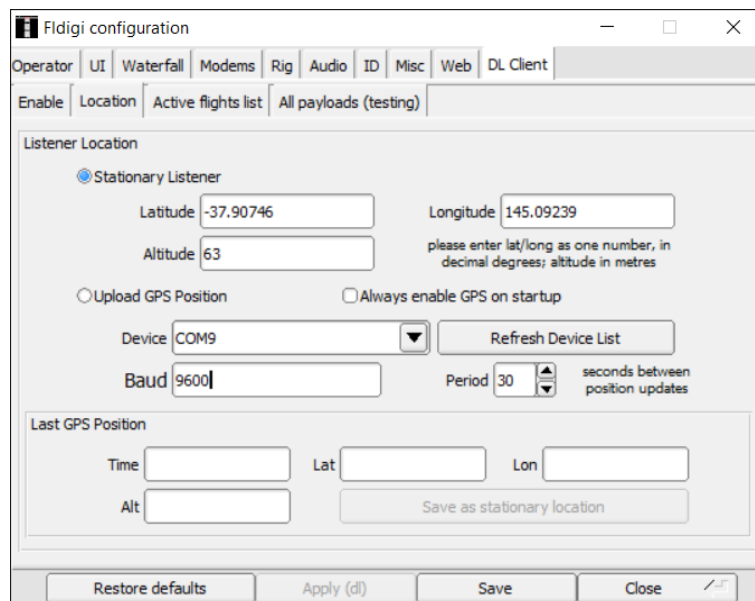


The screenshot shows the 'Fldigi configuration' window with the 'Operator' tab selected. The 'Station' section contains the following fields:

- Callsign: VK3YSP
- Name: Joe
- QTH: Melbourne
- Locator: QF22NC
- Antenna: Dipole
- Radio: IC-7200

At the bottom of the window, there are four buttons: 'Restore defaults', 'Apply (dl)', 'Save', and 'Close'.

5. Select DL Client | Configure | Location. Select Stationary Listener. Enter your lon/lat/alt. Save and close.



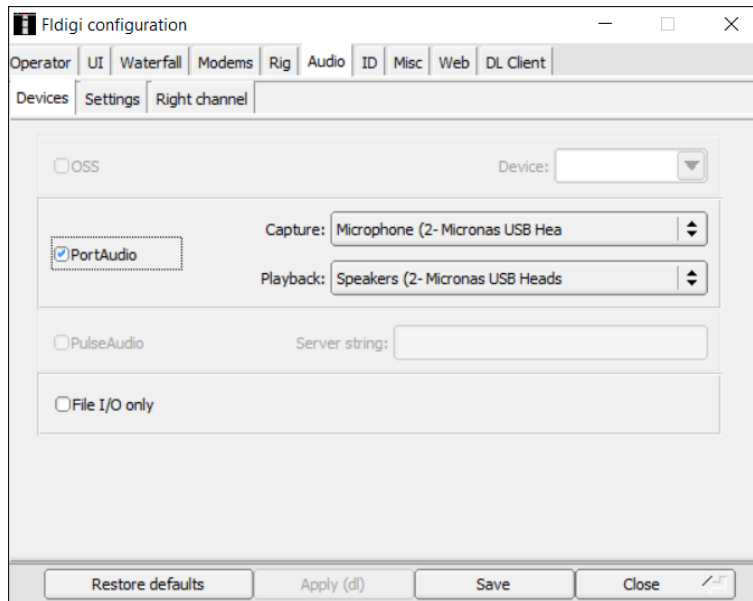
The screenshot shows the 'Fldigi configuration' window with the 'DL Client' tab selected, and the 'Location' sub-tab active. The 'Listener Location' section is configured as follows:

- Stationary Listener
- Latitude: -37.90746
- Longitude: 145.09239
- Altitude: 63
- please enter lat/long as one number, in decimal degrees; altitude in metres
- Upload GPS Position
- Always enable GPS on startup
- Device: COM9
- Refresh Device List (button)
- Baud: 9600
- Period: 30 (seconds between position updates)

The 'Last GPS Position' section contains fields for Time, Lat, Lon, and Alt, along with a 'Save as stationary location' button.

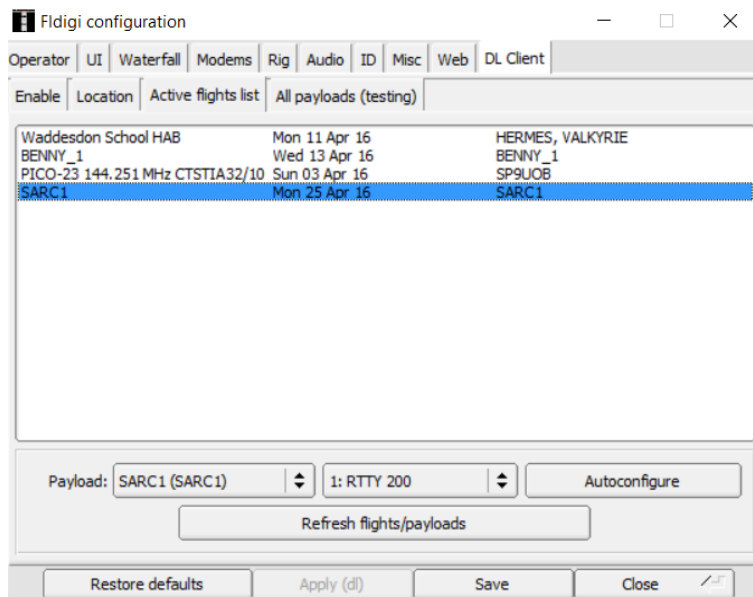
At the bottom of the window, there are four buttons: 'Restore defaults', 'Apply (dl)', 'Save', and 'Close'.

6. Select Configure | Sound Card. Select sound card capture and playback devices. Save and close.



7. Select Browse all button. Select Refresh flights/payloads.

8. Select SARC1. Save and Close.



9. Select Op Mode | PSK | BPSK31.
10. Select Configure | Save config.
11. Connect receiver to antenna and sound card.
12. Tune receiver to 434.650MHz FM.
13. Turn off receiver squelch.
14. Point directional antennas towards payload location.
15. Adjust dl-fldigi cursor frequency to 1255Hz.
16. Adjust receiver volume and audio level of recording device to suit.
17. Example Frame: VK3YSP\$SARC1,1,11:33:00,-3754.44821,14505.54188,47,4.2,+25.4,04\*520E
18. Observe Checksum is good; Frame is green and "Uploaded payload\_telemetry successfully" is shown.

The screenshot shows the dl-fldigi software interface for High Altitude Balloon Tracking. The window title is "dl-fldigi - dl-fldigi for High Altitude Balloon Tracking". The interface includes a menu bar (File, Op Mode, Configure, View, Help, DL Client) and several control panels.

**Flight Panel:** Shows "SARC1: SARC1" with a "Browse all" button. The "Payload" section is set to "SARC1 (SARC1)" and "Multi mode" is "1: RTTY 200". There are buttons for "Auto-configure" and "Auto-mode-switch".

Callsign	Time	Latitude	Longitude	Altitude	Checksum	Bearing	Distance	Elevation	Time since Rx
SARC1	11:35:00	-36.092554	145.092344	64	GOOD :-)	360.0	201.8km	-0.9	just now

**Frame List:** A list of received frames is shown, with the most recent one highlighted in green:

```

VK3YSP$SARC1,1,11:33:00,-3754.44821,14505.54188,47,4.2,+25.4,04*520E
VK3YSP$SARC1,2,11:34:00,-3754.44762,14505.53943,61,3.8,+29.3,07*3276
VK3YSP$SARC1,3,11:35:00,-3754.44676,14505.54064,64,3.8,+38.3,07*2CF1

```

**Frequency Display:** A spectrum display shows a signal at 1255 Hz. The frequency scale ranges from 500 to 1500 Hz.

**Control Panel:** Includes buttons for "WF", volume control (-20, 70, x2), "NORM", "1255", "QSY", "Store", "Lk", "Rv", "T/R", "BPSK31", "s/n 30 dB", "imd -22 dB", and a status bar showing "Uploaded payload\_telemetry successfully".

19. Browse: <http://tracker.habhub.org>
20. Enter SARC1 and press S
21. Observe balloon data, location and listener callsign.
22. Good luck and thanks for tracking!

The screenshot shows the web interface of the habhub tracker. At the top, the browser address bar displays 'http://tracker.habhub.org/#'. Below the browser, a navigation bar contains various icons and the text 'habhub tracker (high altitud...'. The main content area is divided into three sections:

- Left Sidebar:** Displays tracking data for 'SARC1'. It includes a 'Map' button, a 'Last: 1 day' filter, and a 'Path' button. The data shown is:
  - 0.0 m/s 0.0 m/s (Rate)
  - 64 m (64 m) (Altitude)
  - 2016-04-11 21:35:00 (Date/Time)
  - 37.90745, 145.09234 (Coordinates)
  - 7 (Satellites)
  - 38.3°C (Temperature)
  - 3.8 (Volts)
  - Received 1m ago via: VK3YSP
- Main Map:** A Google Map showing a residential street grid. A green circle is drawn around a location labeled 'SARC1' near Wilson St and Golf Links Ave. A blue balloon icon is positioned at the center of the circle.
- Right Panel:** Contains a 'Welcome' message with a question mark icon. Below it, there is a chat invitation: 'Chat with us #highaltitude on irc.freenode.net'. A section titled 'Monday, 11 April' lists events:
  - 10:00 Waddesdon School HAB
  - 10:00 BENNY\_1
  - Monday, 25 April
  - 00:00 SARC1
  - When: Mon. 25 April, 00:00 – 04:00
  - Where: Victory Park, 21 Patterson St Bentleigh, Victoria, Australia (lat: -37.924251 lon: 145.030917 alt: 20M)
  - Description: Project ANZAC Day Special Amateur Radio Event, Group: School Amateur Radio Club Network, Location: Victory Park, 21 Patterson St Bentl...